med associates inc

*instrumentation and software for research*

# RESPONSE KEY WITH LCD STIMULUS DISPLAY

ENV-131M

USER'S MANUAL

**DOC-041**
**Rev. 1.1**

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notes

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# CHAPTER 1 | INTRODUCTION

The ENV-131M Response Key with LCD stimulus display includes on-board, non-volatile memory to hold up to sixty-four 240 pixel (H) x 320 pixel (V) color bitmaps, at 16 bits per pixel, and displays them on a backlit, TFT liquid crystal display (LCD).

The LCD equipped ENV-131M Response Key conveniently replaces the obsolete projector equipped ENV-130M Pigeon Key and comes preloaded with the same images and colors previously found on the ENV-130M Pigeon Key for a total of 48 pre-loaded images and colors

If using the ENV-131M as a replacement for an obsolete ENV-130M, or as additional response keys in concert with existing ENV-130M's, take note of the 12 Output line (MED legacy) image control discussion that is discussed in this document.

Custom images and colors can be created and/or edited by the end user and then downloaded to the ENV-131M using our optional Image Downloader (ENV-131M-DL).

## Specifications

**Power Requirement**:

28 Volts DC @ 250 mAmps (maximum)

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**Note**: 28 volts is supplied to the ENV-131M via the OUT 1 or the 28V POWER connector.

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**Dimensions**:

The ENV-131M Response Key is designed to fit our ENV-007 and ENV-008 standard operant test chambers.

Height: 4.875" or 12.4 cm

Width: 3.063" or 7.8 cm

Depth: 2.8" or 7.1 cm

**Weight**:

1.1 lbs / 0.5 kg

**Tap force required to depress the Response Key**:

12 to 15 grams of force (typical)



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## *Hardware*

*Figure 1.1 – ENV-131M Response Key with LCD stimulus Display*

*Figure 1.2 – SG-222 input cable*

*Figure 1.3 – SG-131 output cable*

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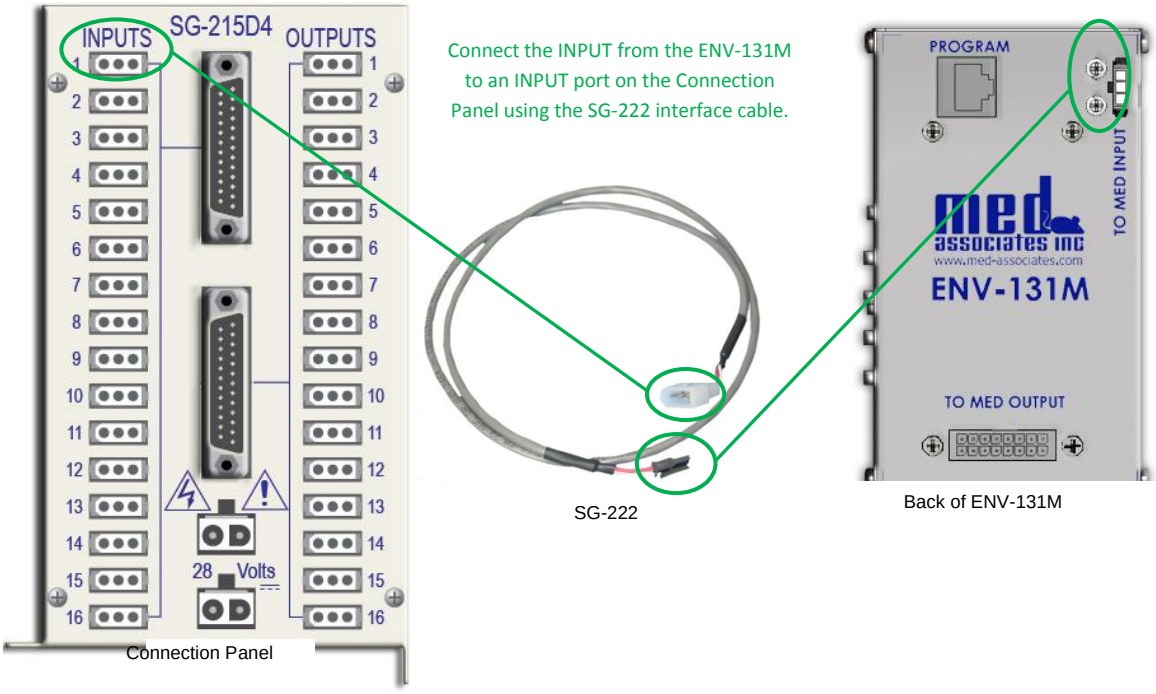
## CHAPTER 2 | CONNECTING THE COMPONENTS

OUTPUTS to the ENV-131M Response Key and the INPUT from the ENV-131M are handled by any of several choices of MED Associates connection panels, for example, the SG215D4 connection panel, shown in Figure 2.1, or the SG-716B connection panel.

The INPUT from the ENV-131M is the tap key response from the test subject. Connect the SG-222 cable from the port labeled TO MED INPUT on the ENV-131M to an available INPUT on the connection panel.

*Figure 2.1 – Connecting the Input from the ENV-131M to the Connection Panel*




**Note**: A DIG-712F input card, which is rated for 100 inputs per second, must be used with the ENV-131M.

Because the OUTPUT connections to the ENV-131M determine which image is displayed on the LCD screen, it is recommended that the OUTPUT lines are connected in order as labeled on the conductors beginning with “OUT 1”, followed by “OUT 2”, then “OUT 3”, etc.



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The “28V POWER” connector, as shown in Figure 2.2, is only required if for any reason the “OUT 1” connector is not being used.

The “OUT 1” connector also has the 28 Volt power connection that is required to provide power to the ENV-131M (as shown in Figure 2.3).

*Figure 2.2 – Connecting the Outputs from the ENV-131M to the Connection Panel*

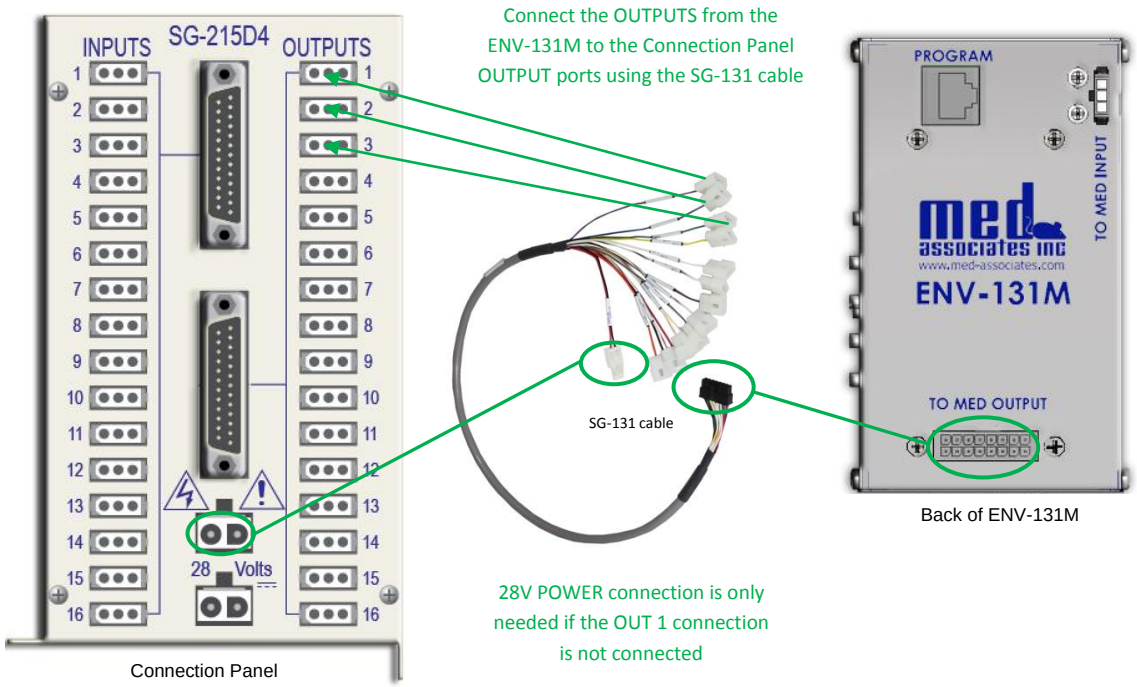
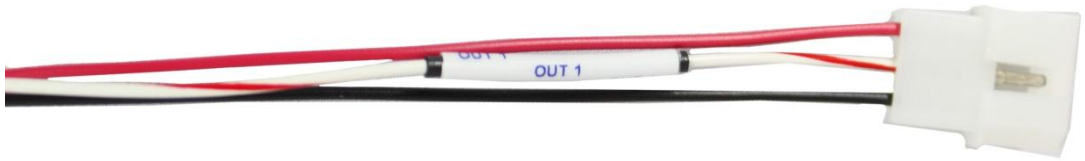



*Figure 2.3 – OUT 1 Connector on the SG-131 Interface Cable*



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# CHAPTER 3 | OPERATION

### Power up Sequence

Upon initial application of 28 volt power from the connection panel to the ENV-131M, either via the “OUT 1” connector or the “28V POWER” connector, the display screen will “blink” all white and then go dark again.

A convenient way to check that the ENV-131M is receiving power and is operational is to use the RESET or the START push buttons as described below.

### RESET Push button

To check the operational status of the ENV-131M, press the RESET push button on the side of the unit and note that the LCD screen will illuminate all white as long as the RESET button is held in. Releasing the RESET push button will allow the LCD display to go dark again.

### START Push button

Pressing the START push button on the side of the unit will cause the ENV-131M to enter the Image Download mode of operation. This mode of operation will be annunciated by LED #1, located below the START push button, being illuminated on the side of the unit.

For more information on the Image Download mode of operation, refer to DOC-249 ENV-131M-DL User’s Manual, which explains in detail the use of the ENV-131M-DL Screen Image Loader transfer connection box and the supporting PC application software (SOF-400).

If the START push button was pressed inadvertently, and downloading images to the ENV-131M is not desired at this time, then the RESET push button may be pressed to escape from this mode of operation.

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**Note**: While in the Image Download mode of operation, the display will be frozen and hold the last image or combination of images that were being displayed. Further changes to the logic levels on the control lines being utilized will not affect the displayed image. To return the ENV-131M to normal operation, press the RESET push button as discussed above.

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**Output Lines Control for Displayed Image Selection**

The selection of displayed images on the ENV-131M is controlled by changing the voltage levels, 0 Volts or 28 Volts, on the OUTPUT lines to the ENV-131M, which are plugged into the connection panel OUTPUT jacks.

The ENV-131M can display images using either a 6 OUTPUT or a 12 OUTPUT line control configuration as discussed below. A table that lists all 48 standard images and the output line controls needed to display each image in both the 6 and 12 line control configurations is shown in Appendix A.

**6 Output lines (binary) image control**

If OUTPUT lines #1 to #6, from the SG-131 interface cable, are plugged into OUTPUTS on a connection panel and the Mode Select line is not connected, then up to 64 different images can be displayed on the ENV-131M (See Appendix A for the image and color list).

Table 3.1 lists the number of images that can be displayed based on the number of available outputs on the connection panel. As an example, 2 images can be displayed even if only 1 output port is available since the first image will be displayed when the output port is **OFF** and the second image will be displayed when the output port is toggled **ON**.

To use the 6 output line image control:

1. Plug in the desired number of output lines from the SG-131 cable to the connection panel.
2. Provide power to the ENV-131M by plugging OUT 1 into an available output on the connection panel. If OUT 1 is not being used, the large, 28V connector must be plugged into one of the 28 Volt connections at the bottom of the connection panel.

**NOTE:** The ENV-131M will not be damaged if both power connectors are plugged in.

*Table 3.1 – Number of images capable of being displayed in 6 line mode.*

| # of available outputs | # of available images |
|---|---|
| 1 | Up to 2 |
| 2 | Up to 4 |
| 3 | Up to 8 |
| 4 | Up to 16 |
| 5 | Up to 32 |
| 6 | Up to 64 |



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**NOTE:** The output lines from the SG-131 may be connected to any available output connectors on the connection panel, although MED Associates highly recommends connecting the outputs to the panel in a sequential order, if possible.

For example, OUT 1 on the SG-131 cable may be connected to output port #8 on the connection panel and then OUT 2 to OUT 6 should then be connected to output ports 9 to 13.

**12 Output lines (MED legacy) image control**

Since the ENV-131M is a direct replacement for the obsolete ENV-130M Pigeon Key, the legacy mode of operation allows backward compatibility with MED-PC protocols developed for the ENV-130M.

Any users who are replacing obsolete ENV-130M's, or who are adding ENV-131M's as additional response keys to their existing systems, will benefit from utilizing this mode of image control in conjunction with their existing or expanded written protocols.

To operate in Legacy mode, connect all 12 output line connectors.

The connector labeled **Mode Select** must also be connected to the connection panel in order to use the 12 output lines of (legacy) image display control. The Mode Select connector can be plugged into any INPUT or OUTPUT port on the connection panel.

When output lines OUT 1 to OUT 12 from the SG-131 cable are plugged into a connection panel, up to 48 images can be displayed on the ENV-131M (See Appendix A for the image and color list).

To use the 12 output line image control:

1. Plug in all 12 output lines from the SG-131 cable to the connection panel.
2. Plug in the MODE SELECT line into any available input or output; the connector is designed so that it is always ON when plugged in. No programming changes are required.
3. Provide power to the ENV-131M by plugging OUT 1 into an available output on the connection panel. If OUT 1 is not being used, then the large, 28V POWER connector must be plugged into one of the 28 Volt connections at the bottom of the connection panel.

**NOTE:** The ENV-131M will <u>not</u> be damaged if both power connectors are plugged in.

### Initiate Operation of the ENV-131M

Now control the image, or combination of images, displayed by changing the logic level to 0 Volts (Active LOW) on the associated control lines from within the MED PC software.



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## APPENDIX A | ENV-131M - 6 AND 12 OUTPUT LINES IMAGE KEY

| | # | 6 line active lines | 12 line active lines | | # | 6 line active lines | 12 line active lines | | # | 6 line active lines | 12 line active lines |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | ? | ? | | 16 | 5 | 9 | | 32 | 6 | 11 |
| △ | 1 | 1 | 1 | △ | 17 | 1, 5 | 1, 9 | △ | 33 | 1, 6 | 1, 11 |
| ○ | 2 | 2 | 2 | ○ | 18 | 2, 5 | 2, 9 | ○ | 34 | 2, 6 | 2, 11 |
| + | 3 | 1, 2 | 3 | + | 19 | 1, 2, 5 | 3, 9 | + | 35 | 1, 2, 6 | 3, 11 |
| □ | 4 | 3 | 4 | □ | 20 | 3, 5 | 4, 9 | □ | 36 | 3, 6 | 4, 11 |
| × | 5 | 1, 3 | 5 | × | 21 | 1, 3, 5 | 5, 9 | × | 37 | 1, 3, 6 | 5, 11 |
| \| | 6 | 2, 3 | 6 | \| | 22 | 2, 3, 5 | 6, 9 | \| | 38 | 2, 3, 6 | 6, 11 |
| — | 7 | 1, 2, 3 | 7 | — | 23 | 1, 2, 3, 5 | 7, 9 | — | 39 | 1, 2, 3, 6 | 7, 11 |
| | 8 | 4 | 8 | | 24 | 4, 5 | 10 | | 40 | 4, 6 | 12 |
| △ | 9 | 1, 4 | 1, 8 | △ | 25 | 1, 4, 5 | 1, 10 | △ | 41 | 1, 4, 6 | 1, 12 |
| ○ | 10 | 2, 4 | 2, 8 | ○ | 26 | 2, 4, 5 | 2, 10 | ○ | 42 | 2, 4, 6 | 2, 12 |
| + | 11 | 1, 2, 4 | 3, 8 | + | 27 | 1, 2, 4, 5 | 3, 10 | + | 43 | 1, 2, 4, 6 | 3, 12 |
| □ | 12 | 3, 4 | 4, 8 | □ | 28 | 3, 4, 5 | 4, 10 | □ | 44 | 3, 4, 6 | 4, 12 |
| × | 13 | 1, 3, 4 | 5, 8 | × | 29 | 1, 3, 4, 5 | 5, 10 | × | 45 | 1, 3, 4, 6 | 5, 12 |
| \| | 14 | 2, 3, 4 | 6, 8 | \| | 30 | 2, 3, 4, 5 | 6, 10 | \| | 46 | 2, 3, 4, 6 | 6, 12 |
| — | 15 | 1, 2, 3, 4 | 7, 8 | — | 31 | 1, 2, 3, 4, 5 | 7, 10 | — | 47 | 1, 2, 3, 4, 6 | 7, 12 |



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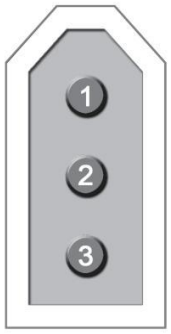
## APPENDIX B |TECHNICAL REFERENCE

SG-131 **Mode Select** pinout (connect to any INPUT or OUTPUT for 12 line Legacy control):

| Molex Pin # | Function |
|---|---|
| 1 | ON |
| 2 | n/a |
| 3 | n/a |

SG-131 Output connector **OUT 1** pinout:

| Molex Pin # | Function |
|---|---|
| 1 | 28V Ground |
| 2 | Operate (ON/OFF) |
| 3 | +28 Volts |



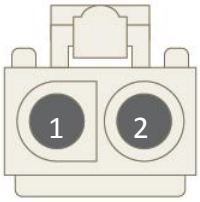

3 Pin Molex Output Connector

SG-131 Output connectors **OUT 2** to **OUT 12** pinout:

| Molex Pin # | Function |
|---|---|
| 1 | n/a |
| 2 | Operate (ON/OFF) |
| 3 | n/a |

SG-131 **28V POWER** pinout:

| Molex Pin # | Function |
|---|---|
| 1 | 28V Ground |
| 2 | +28 Volts |




2 Pin Molex Power Connector



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## APPENDIX C | CONTACT INFORMATION

Please contact MED Associates, Inc. for information regarding any of our products. Visit our website at www.med-associates.com for contact information and access to our Technical Manual Library, software drivers, release notes, and FAQs on our Customer Portal. For technical questions, email support@med-associates.com.



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